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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/017,860      | 12/14/2001  | David Adler          | P989                | 1659             |

31894 7590 03/28/2006  
OKAMOTO & BENEDICTO, LLP  
P.O. BOX 641330  
SAN JOSE, CA 95164

EXAMINER

AHMED, SAMIR ANWAR

ART UNIT PAPER NUMBER

2624

DATE MAILED: 03/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                                      |                                     |  |
|------------------------------|--------------------------------------|-------------------------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/017,860 | <b>Applicant(s)</b><br>ADLER ET AL. |  |
|                              | <b>Examiner</b><br>Samir A. Ahmed    | <b>Art Unit</b><br>2624             |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 03 January 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,2,18,20 and 28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-2, 18, 20, 28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

Art Unit: 2624

1. The amendment filed 1/03/06 have been entered and made of record.
2. In response to the amendment filed 1/03/06, the 112, second paragraph rejection of claim 28 has been withdrawn.
3. Applicant's arguments filed 1/03/06 have been fully considered but they are moot with regard to claim 1, in view of new grounds for rejection.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1, 18, 20 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Wagner et al. (U.S. Patent 5,659,172) and Tsai et al. (U.S. Patent 5,822,055). The grounds for rejections stated in paragraph 7 of the Office Action mailed on 9/29/05, are incorporated by reference herein.

As to claim 1, refer to claim 1 rejection stated in paragraph 7 of the Office Action mailed on 9/29/05, are incorporated by reference herein. Wagner further discloses, wherein said information is processed includes calculating a first function representing a comparison between said first and third datasets and calculating a second function representing a comparison between said second and fourth datasets [a comparison step is carried out for each perspective (detector) separately (col.7, lines 6165). The base and reference images of each perspective (detector) are compared separately

(col. 8, lines 11-12). A comparison map (difference image) is created by calculating the absolute difference of the base and reference area images (col. 8, lines 20-24). The generation of a separate comparison map (difference image) for each of the two perspectives (first and second detectors) followed by generating a completed comparison map from the comparison maps (difference images) of the individual perspectives (detectors) (col. 10, lines 15-19, col. 8, lines 65-67). As shown by Figs 2 and 8, comparison map 2 (difference image) is created by calculating the absolute difference of the base (first dataset) and reference (third dataset) area images of perspective 1 (first detector). Comparison map 1 (difference image) is created by calculating the absolute difference of the base (second dataset) and reference (fourth dataset) area images of perspective 2 (second detector)]. Wager further discloses a final step of comparison crosschecking process to classify defects (col. 9, lines 47-49). A completed comparison map is generated from the separate comparison maps (difference images) of the individual perspectives (detectors) by combining the two perspective comparison maps (see Figs 2, 8, col. 10, lines 13-18).

Wagner does not explicitly disclose, classifying the detected defect using output values of the first and second functions.

Tsai discloses an inspection method to inspect a first pattern on a specimen substrate for comparison against a second pattern that is intended to be the same (reference wafer) using two detectors, generating a difference image for each detector and classifying the defects based on the overall combined difference images of both detectors in a post processing step. As shown in Figs 5a, 5b, an image (first data set) of

Art Unit: 2624

a die or a cell (first region) on a test wafer is captured by a bright field detector (first detector) (fig.5a, items 14, 16). An image (second data set) of the die or cell (at least portion of the first region) is captured by a dark field detector (second detector) (fig. 5a, items 14, 16'). An image (third data set) of a die or cell (second region) on a reference wafer that is intended to be the same or similar to the die or cell on the test wafer is captured by the bright field detector (first detector). An image (fourth data set) of the die or cell (at least a portion of the second region) on the reference wafer that is intended to be the same or similar to the die or cell on the test wafer is captured by the dark field detector (second detector) (col. 6, lines 41-61). A subtractor 94 generates a difference image (first function) representing the comparison between the first and third images (data sets) of the bright field detector (first detector), and a subtractor 94' generates a difference image (second function) representing the comparison between the second and fourth images (data sets) of the dark field detector (second detector) (Fig. 5b, items 94,94', col. 7, lines 23-41). The output is provided to a post-processing step to classify the defects by clustering the similar detects using a histogram (Col. 7, lines 10-13, lines 42-55). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Tsai's teachings to modify Wagner's method by using a post processing step to classify the detected defects using the output values of the first and second difference images of Wagner in order to determine with extremely high precision the type of defects exist on the surface of the wafer and exclude noise associated with the imaging system from being detected as a defect, and reduce more effectively false defect detection.

As to claim 18, both Wagner [the comparison is difference image (see claim 1 above), a difference image is an image subtraction] and Tsai (Fig. 5b) further discloses, wherein said comparison is an image subtraction.

As to claim 20, Tsai further discloses wherein defects whose output values of the first and second functions cluster together are classified as a same defect type (Fig. 6).

As to claim 28, Wagner further discloses, wherein at least two portions of said substrate are exposed to charged particles, and wherein said detectors are used to detect charged particles emitted from said portions, and wherein data from said detectors is used to determine whether potential defects exist within said portions (Fig. 1, col. 4, lines 13-24).

6. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Wagner et al. (U.S. Patent 5,659,172) and Tsai et al. (U.S. Patent 5,822,055) as applied to claim 1 above and further in view of Maeda et al. (U. S. Patent 6,169,282). The grounds for rejections stated in paragraph 9 of the Office Action mailed on 9/29/05, are incorporated by reference herein.

As to claim 2, refer to claim 2 rejection stated in paragraph 9 of the Office Action mailed on 9/29/05, are incorporated by reference herein.

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Samir A. Ahmed whose telephone number is (571) 272-7413. The examiner can normally be reached on Mon-Fri 8:30am-6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Bella can be reached on (571) 272-7778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Application/Control Number: 10/017,860  
Art Unit: 2624

Page 7

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